



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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In re application of

Docket No: Q45980

Hisashi YAMAGISHI, et al.

Appln. No.: 08/898,853

Group Art Unit: 3711

Confirmation No.: 6473

Examiner: Raeann Gorden

Filed: July 25, 1997

For: MULTI-PIECE SOLID GOLF BALL

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TECHNOLOGY CENTER R3700

APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. §1.192

Commissioner for Patents
Washington, D.C. 20231

Sir:

In accordance with the provisions of 37 C.F.R. § 1.192, Appellant submits the following:

I. REAL PARTY IN INTEREST

The real party in interest is Bridgestone Sports Co., Ltd., the owner by assignment of all rights, title, and interest in the present application.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences with respect to the present application. However, Appellant seeks allowance of the present Claims 13-19 to provoke an interference with U.S. Patent No. 5,743,816, issued to Ohsumi et al.

III. STATUS OF CLAIMS

Claims 13-19 are pending in the application. All claims stand finally rejected.

IV. STATUS OF AMENDMENTS

In an Office Action dated March 8, 2002, the Examiner finally rejected claims 13-19, and allowed claims 1-12. A Response under 37 C.F.R. §1.116 and a Supplemental Response under 37 C.F.R. §1.116 were filed on June 10 and 11, 2002, respectively. No amendments were presented in either of these two Responses. The Examiner issued an Advisory Action on June 24, 2002, maintaining the final rejection of Claims 13-19 and the allowance of Claims 1-12.

On October 10, 2002, Appellant filed an Amendment Under 37 C.F.R. §1.116, canceling claims 1-12. The Amendment was entered, thus leaving finally rejected Claims 13-19 pending in the present application. (See, Advisory Action dated October 25, 2002).

V. SUMMARY OF THE INVENTION

The present invention as defined by the pending claims, Claims 13-19, relates to a multi-piece solid golf ball having a structure of at least four layers which has improved flying performance, hitting feel, controllability, and durability. For example, the golf ball according to the present invention, provides sufficient carry when struck by a driver, has

more spin when shot with a iron, and has controllability typical of a wound type balata covered golf ball.

Figure 2 illustrates a golf ball according to the present invention. The ball has at least four pieces. The golf ball includes an inner sphere 12 and a layer 13 surrounding the inner sphere, an inner cover layer 15, and an outer cover layer 16. The surrounding layer 13 may be a single layer or have a plurality of layers. (See, application, p. 5.)

The outer cover layer 16 is formed to a hardness of about 40 to 60 degrees, preferably 40 to 58 degree on Shore D. The inner cover layer 15 has a hardness of up to 53 degrees, preferably up to 50 degrees on Shore D. The inner cover layer 15 should be formed softer than the outer cover layer 16. (See, application, p. 6:3-5.)

Further, the outer cover layer 16 has a gage (or radial thickness) of 0.5 to 3.0 mm, and the inner cover layer 15 has a gage of 0.5 to 3.0 mm. The entire cover 14 has a gage of 1.0 to 5.0 mm. (See, application, p. 6:11-15.)

The inner and outer cover layers 15 and 16 may be formed to have the above-defined hardness using thermoplastic resins such as ionomer resins and non-ionomer resins alone or in admixture. (See, page 6).

In the core 11, the inner sphere 12 preferably has a Shore D hardness of 20 to 55 degrees, and a distortion of 2.6 to 8.7 mm, under a load of 100 kg. The inner sphere 12 preferably has a diameter of 20 to 39 mm. (See page 7).

The inner sphere 12 of the core may be formed of rubber material based on polybutadiene, which is vulcanized with an organic peroxide with the aid of a crosslinking agent such as zinc (meth) acrylate.

The surrounding layer 13 is formed around the inner sphere 12, and has a hardness of least 45 degrees on Shore D. It is preferred that the hardness of the surrounding layer 13 be greater than the hardness of the inner cover layer 15, and that the hardness of the surrounding layer 13 be greater than the hardness of the inner sphere 12 for compensating for short restitution of the very soft inner sphere 12.

The surrounding layer 13 has a gage of 1.0 to 10 mm. The surrounding layer 13 may be formed mainly of thermoplastic resins such as ionomer resins or rubber based materials like the inner sphere 12. (See page 7:26-28).

The golf ball according to the present invention is prepared in accordance with the Rules of Golf, that is, to a diameter of least 42.67 mm and a weight of not greater than 45.93 grams. The golf ball preferably has a distortion or compression of 2.5 mm to 4.0 mm under a load of 100 kg. (p. 9).

Beginning on page 9 of the present application and continuing through page 11, there are disclosed examples of golf balls made according to the present invention. Table 1 in particular sets forth pertinent characteristics of seven examples, named E1 to E7.

VI. ISSUES

Whether, under 35 U.S.C. §112, first paragraph, Claims 13-19 contain subject matter which is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

VII. GROUPING OF CLAIMS

Claims 13, 14, 17 and 19 stand or fall together. Claims 15, 16 and 18 do not.

VIII. ARGUMENTS

Whether, under 35 U.S.C. §112, first paragraph, claims 13-19 contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Examiner rejects claims 13-19 based on a position that the "specification does not substantially disclose a third layer on the core of the golf ball." The Examiner states:

There is an option of providing additional layers (spec 9, line 5) but there is no specific details given the characteristics. Particularly there is no mention of the Shore D hardness being less than the second layer (claim 13) or the thickness (claim 15). Furthermore, there is no mention of the specific gravity in claim 16 or the materials in claim 18.

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

Appellant respectfully disagrees with the Examiner's position and, accordingly, requests that the Board overturn this rejection in view of the following reasons.

A. Claim 13

Claim 13 is directed to a four piece golf ball as disclosed in the present application and illustrated in Fig. 2 as an example. Claim 13 recites:

A solid golf ball comprising a solid core having a three-layered structure composed of an inner layer, an intermediate layer formed outside said inner layer, and an outer layer formed outside said intermediate layer, and a cover for coating said solid core, wherein:

said inner layer is designed to have a Shore D hardness which is lower than that of said intermediate layer;.

said intermediate layer is designed to have a Shore D hardness of 45 to 65; and

said outer layer is designed to have a Shore D hardness which is lower than that of said intermediate layer.

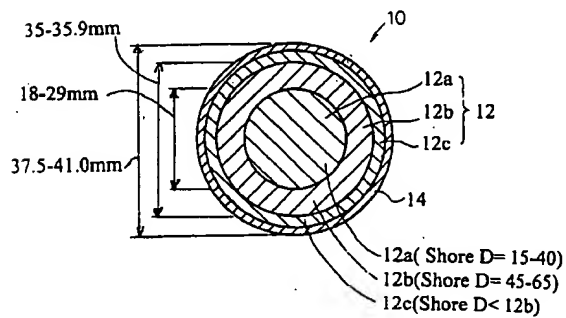
During the course of prosecution, Claim 13 (and claims 14-19) were copied verbatim from U.S. Patent No. 5,743,816, and added to the present application to provoke an interference. Both the present application and the Ohsumi patent are directed to four-piece solid golf balls. The layers of the golf ball disclosed in the Ohsumi Patent correspond to the layers of the golf ball disclosed in the present application as follows:

APPELLANT'S BRIEF ON APPEAL
 UNDER 37 C.F.R. § 1.192
 U.S. Appln. No.: 08/898,853

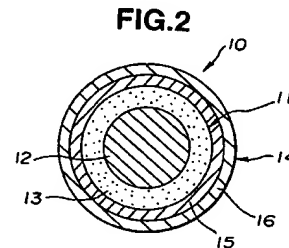
Ohsumi Patent	The Present Application
Inner layer 12a	Inner sphere 12
Intermediate layer 12b	Layer 13
Outer layer 12c	Inner cover layer 15
Cover 14	Outer cover layer 16

For ease of reference, the relevant figures from the Ohsumi Patent (left) and the present application (right) are reproduced below.

The Ohsumi Patent



The Present Application



The issue turns to this: The present application characterizes one of the intermediate layers (i.e., the inner cover layer 15) as part of the cover; whereas the Ohsumi patent characterizes the same intermediate layer (i.e., the outer layer 12c) as part of the core. Thus, even though both the inner cover layer in the present application and the outer layer 12c in Ohsumi patent are the third layer from inside-out or second

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

layer from outside-in and have similar if not the same material properties (e.g., hardness and composition), the two disclosures refer to them differently. Clearly, in each instance, the positioning of the third layers are identical and even the compositions of the layers are nearly the same. It is merely a matter of nomenclature as to whether one considers the third layer as part of the core or the cover.

The Examiner's position is that because the present application denominates the layer 15 as a layer of the cover, that same layer cannot also be called a part of the core. The Examiner maintains this position even though structurally the ball is the same regardless of how one denominates an intermediate layer of the ball.

As will be pointed out, there is no standard naming convention within the relevant industry of golf ball design and manufacturing as to whether an intermediate layer is properly characterized as part of the core or part of the cover. There are general guidelines; for example, the inner most sphere is often made of a rubber based material and referred to as a core; and the outermost layer of the ball is generally called a cover. But the same is not true for intermediate layer(s) of a ball, and there is no reason to.

In support of Appellant's position herein, Appellant first demonstrates that the present application provides ample support for the subject matter of claims 13, 15, 16 and 18. Secondly, Appellant relies on past positions of a prior Examiner assigned to this case and prior decisions of the Board of Patent Appeals and Interferences when the same issue was presented. Third, Appellant refers to the Declaration of Mr. Larry Cadorniga, a designer in the field with over 20 years experience. Lastly, Appellant has a

chart of patents that show there is no naming convention in the literature as to whether an intermediate layer is called a core or cover or both.

1. The Present Application Provides Ample Support For The Subject Matter Of Claims 13, 15, 16 and 18¹

Claim 13 does not recite a five-piece golf ball or a three-piece golf ball. Instead, Claim 13 recites a four-piece golf ball including a core having a three layered structure including (1) inner layer; (2) intermediate layer; and outer layer. As the fourth layer, Claim 13 recites a cover to cover the solid core. Thus, putting aside how the layers are denominated, the present application clearly discloses a solid golf ball having four pieces including the inner sphere 12, layer 13, inner cover layer 15, and outer cover layer 16.

Claim 13 next recites:

said inner layer is designed to have a Shore D hardness
which is lower than that of said intermediate layer;

The claimed "inner layer" corresponds to the inner sphere 12 as disclosed in the present application. The present application discloses that the inner sphere 12 is softer

¹ The Examiner has raised issues with respect to claims 13, 15, 16 and 18. However, on several previous occasions, including the Personal Interview on October 16, 2001, the Examiner confirmed that the only remaining issue dealt with respect to claim 13 – whether the present application provides support for claim 13 which recites a core including three layers and a cover – and that any issues concerning claims 15, 16 and 18 have been resolved. This is further shown by the Examiner's statements on page 3 of the Final Office Action where only claim 13 is addressed. Nevertheless, Appellant addresses these other dependent claims.

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

than the layer 13, based on Shore D hardness scale. See, page. 7:14-18 ("It is preferred that ... the hardness of the surrounding layer 13 be greater than the hardness of the inner shpere 12 ...") Further, Table 1 provides that in each example (E1 to E7) the Shore D hardness of the inner sphere 12 ("inner layer") is softer than the surrounding layer 13 ("intermediate layer"). See, Table 1, p. 11.

Thus, the present application clearly discloses a golf ball satisfying this element of claim 13.

Claim 13 next recites:

said intermediate layer is designed to have a Shore D hardness of 45 to 65; and

The present application further discloses that layer 13 which corresponds to the "intermediate layer" as claimed has a Shore D hardness of at least 45. See, p. 7:8-12. The layer 13 has a Shore D hardness of 65 in Examples 6 and 7. See, Table 1, E6 and E7.

Lastly, Claim 13 recites:

said outer layer is designed to have a Shore D hardness which is lower than that of said intermediate layer

The claimed "outer layer" corresponds to the inner cover layer 15 and the "intermediate layer" corresponds to the surrounding layer 13 as disclosed in the present application. The inner cover layer 15 has a Shore D hardness lower than the Shore D

hardness of the layer 13. *See*, p. 7:14-16 ("It is preferred that the hardness of the surrounding layer 13 be greater than the hardness of the inner cover layer 15 ..."). *See also*, Examples E1 - E7 in Table 1.

Thus, the present application discloses every element of claim 13.

2. A Prior Decision By The Board Of Patent Appeals And Interferences Supports Appellant's Position

In a Decision on Appeal rendered by the Board of Patent Appeals and Interferences in application serial no. 09/086,493 (attached at Tab A), the Board ruled on this specific issue, holding:

Shimosaka describes the ball therein as comprising a core (1) and a cover of a multi-layer structure having at least three layers (3, 4, 5), we must agree with the examiner that, as a general proposition, the structure of a four layer or four element solid ball like that in Shimosaka is the same whether a layer, such as layer (3) for example, is denominated as a 'core' layer or 'cover' layer. Thus, it does not appear that appellants' claiming of a core 'consisting of an inner sphere and an enclosure layer surrounding the inner sphere' and a cover 'consisting of an outer layer and an inner layer,' would alone structurally distinguish from the four layer/element construction of Shimosaka.

(Decision On Appeal, p. 4) (emphasis in original)

Thus, the Board specifically rejected the position that the Examiner has taken in the present application. The Board has, in fact, articulated a decision that is in complete alignment with the position taken by Appellant and that necessitates overturning the lone rejection of claims 13-19 under 35 U.S.C. § 112 (first paragraph).

3. Prior Positions Of The PTO Examiners In Charge Of This Application

In the Final Office Action, the Examiner contends that Appellant's position today is "at odds with that taken by the applicants in paper 6 where applicants argued that prior art showing a three piece core and a cover is '*completely distinguishable*' from the ball of the applicants' claims, (emphasis added)."

However, Appellant's prior response dealt with different claims of the present application, claims of different scope than Claim 13 which is now at issue, and claims which are not a part of this application. Moreover, Appellant's prior arguments do not state that what makes the ball "completely distinguishable" was because of the naming of the inner layers as part of the core or cover. Instead, the disclosure of the prior art Higuchi patent at issue then was completely distinguishable from the claims then rejected.

Further, in the Final Office Action, the Examiner relies on "file wrapper estoppel doctrine" and contends "applicants are estopped from now arguing that the inner cover layer may be considered an outer core layer or vice-versa." Appellant has requested the Examiner to cite authority to support the basis for reliance on file wrapper estoppel doctrine. The Examiner has not.

More importantly, however, is that irrespective of what arguments Appellant made long ago, the prior Examiner (Marlo) of the case has taken a position, which is "at odds" with the position that the current Examiner (Gordon) is taken and which is

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

consistent with Appellant's position. Appellant believes it is fundamentally unfair for the Office to take such different positions on the same set of facts during the course of prosecution.

Appellant respectfully submits that the statements set forth in Paper No. 6 and the following Office Actions including the response by the Patent Office demonstrate that Appellant's position now is not "at odds" with the prior sequence of events. In fact, Appellant's position now is entirely consistent with the Patent Office's prior position. In addition, this sequence of events includes the prior position taken by the Patent Office that there is no distinction between an intermediate layer in terms of calling it a portion of the core or a portion of the cover.

Specifically, in the Final Office Action, the Examiner refers to the arguments made by Appellant in prior Paper No. 6, which was submitted October 28, 1998.

Following that submission, however, the Examiner issued a further action deeming the submission on October 28, 1998 (Paper No. 6) as not been fully responsive. The Examiner requested additional argument regarding the Higuchi '311 patent, and accordingly Appellant provided a further response on January 4, 1999.

Next, the Examiner issued an Office Action dated February 23, 1999, responding to the arguments submitted by the Appellant on October 28, 1998 (Paper No. 6) and January 4, 1999. In this Office Action, the Examiner maintained the rejection of the claims based on Higuchi '311. The Examiner stated in particular that the Higuchi '311

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

patent describes a golf ball including four components. The Examiner then described each of those four components, making reference to elements 1, 2, 2b, and 3. On page 3 of the same Office Action, the Examiner stated that reference element 2b (see Fig. 2 of Higuchi '311) inherently is as much a cover element as layer 15, as evidence simply from a comparison of the drawings.

The Examiner thus rejected all arguments submitted by the Appellant including those arguments in Paper No. 6 and maintained that there was no distinction in the immediate layers in terms of it being part of a cover or core. Thus, at this time, the position taken by the Patent Office was that it did not matter whether the inner layer was called a cover or core, but what did matter was the positioning the inner layer relative to other layers of the ball.

Appellant's position now and its argument with respect to claim 13 are entirely consistent with the prior position taken by the Patent Office -- which was that it made no distinction whether the inner layer was described in a prior art reference as being part of the cover or core, but what was important was a position in the overall structure of the ball. Furthermore, this sequence of events shows that the Patent Office is now taking an inconsistent position from its prior position.

4. The Declaration Of Mr. Larry Cadorniga Provides Unrefuted Evidence Supporting Appellant's Position

Appellant further submits the Declaration of Larry C. Cadorniga. (Attached as Tab B.) Mr. Cadorniga has over 20 years of experience in the field of golf ball design. (See, Decl. at ¶3.) As set forth in the Declaration, Mr. Cadorniga confirms that there is no standard definition used in the industry to determine what constitutes a core or a cover. (Decl. at ¶6.) He recognizes that in a two piece ball it is easy to determine the cover and core, but in three or four piece golf balls, it is sometimes not clear how to characterize an inner layer as being part of the cover or core. (Decl. at ¶¶ 6-7.)

Mr. Cadorniga points out general guidelines that can be used to determine whether an inner layer is part of the cover or core. For example, the composition of the inner layer and the diameter of the inner layers can sometimes be used to determine whether an inner layer is part of a cover or core. (Decl. at ¶¶ 8-12.)

Lastly, Mr. Cadorniga has reviewed both the present application and the Ohsumi patent. In his opinion, he believes that the layer 12c in the Ohsumi patent, especially in Example 5 of Table 1, is properly called a cover, not a core, and that Ohsumi has incorrectly labeled this layer based on conventional usage of the terms cover and core. (Decl. at ¶¶ 13 -15.)

5. Objective Evidence Demonstrating That An Intermediate Layer Is Sometimes Denominated A Core Or Cover

Appellant submits herewith a chart (attached at Tab C), listing various U.S. Patents which were filed close to the filing date of the present application and which pertain to four-piece golf balls. The listed patents demonstrate that the names of the second layer and third layer from innermost layer of the golf ball are not determined by any specific rule of the golf ball manufacturers, or the industry in general. Instead, the layers are named by the inventors and his own personal views and naming convention.

The listed patents show that the names of the second layer and the third layer are used loosely and are characterized in no special way. As the attached chart shows, the second and the third layer are named core or cover or intermediate layer. That is, the second and the third layer are called as a part of a core, a part of a cover or an intermediate layer. Also, the types of materials used, including rubbers and resins based materials, in the second and the third layer do not enable a division between what is a cover or a core.

B. Claims 15, 16 And 18

The Examiner implies that the subject matter of Claims 15, 16 and 18 are also not supported by the disclosure of the present application.

A. Claim 15

The Examiner states that there is no mention of the thickness as recited in Claim 15. However, Claim 15 is clearly supported by the present application. Claim 15 recites:

The solid golf ball according to claim 13, wherein said inner layer has a diameter of 20.0 to 29.0 mm, said intermediate layer and said inner layer have a combined diameter of 35.0 to 39.5 mm, and said outer layer, said inner layer, and said intermediate layer have a combined diameter of 37.5 to 41.0 mm.

The claimed "inner layer" corresponds to the inner sphere 12 as disclosed in the present application, and it has a diameter of 20 to 39 mm. Page 6:37 - Page 7:3; Table 1, Example 7. Further, the combined diameter of inner sphere 12 and layer 13 ("intermediate layer" as claimed) is in the range of 35 to 41 mm. Page 7:20-22. See *also*, Table 1, Examples E1 - E7.

Moreover, the inner sphere 12, layer 13 and inner cover layer 15 ("outer layer") have a combined diameter in the range of 37.5 to 41.0 mm. See, Table 1, Examples E1 - E7; page 6:11-25; page 6:35 to page 7:2; page 7:20-24; and page 9:7-10.

Clearly, the present application provides a written description to support claim 15.

B. Claim 16

The Examiner states that there is no mention of the specific gravity as defined in claim 16.

Claim 16 recites:

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

The solid golf ball according to claim 13, wherein a weight distribution in said solid core is designed so that said inner layer has a large specific gravity, and said intermediate layer and said outer layer have specific gravities which are smaller than said specific gravity of said inner layer.

Regarding the issue of specific gravity as recited in claim 16, Appellant respectfully submits that the present application supports claim 16 based on the express disclosure and inherent features of the compositions and diameters of the individual layers.

The subject matter for the specific gravity in Claim 16 is inherent to Examples 1-5 of the present specification. The subject matter is inherent because of the fact that the intermediate layer (or surrounding layer) is formed of a "thermoplastic resin" in Examples 1-5. The composition of the intermediate layer is disclosed at page 10, lines 2-13.

The specific gravity of both inner and intermediate layers in Examples 1-5 can be calculated as follows.

Calculation of the specific gravity of inner and intermediate layers:

The specific gravity of the inner and intermediate layers are calculated using the stated values in Table I of the specification and from derived values. It should be noted that the terms including inner sphere, surrounding layer, inner cover layer and outer cover layer in Table 1 correspond to inner layer, intermediate layer, outer layer and cover in Claim 13 and 16, respectively.

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

Calculation:

(1) Stated values:

The parameters for diameter and gage (thickness) of the claimed golf ball are stated in Table I of the specification.

TABLE I

		Example 1	Example 2	Example 3	Example 4	Example 5
Inner layer	Diameter (mm)	35.30	35.30	33.90	33.50	35.30
	Shore D hardness	47	45	40	45	45
Intermediate layer	Diameter (mm)	37.90	37.90	37.90	36.10	37.90
	Shore D hardness	68	73	68	68	68
Outer layer	Gage (mm)	1.25	1.25	1.25	1.5	1.25
	Shore D hardness	40	45	40	40	35
Cover	Gage (mm)	1.15	1.15	1.15	1.80	1.15
	Shore D hardness	47	51	51	55	47
Ball	Diameter (mm)	42.70	42.70	42.70	42.70	42.70

(2) Values Derived:

(a) Diameter and gage:

Diameter and/or gage of each layer which are not stated in Table I can be calculated by simple subtraction between the appropriate stated values in Table I. The results are in Table II below.

TABLE II

		Example 1	Example 2	Example 3	Example 4	Example 5
Inner layer	Diameter (mm)	35.30	35.30	33.90	33.50	35.30
Intermediate layer	Diameter (mm)	37.90	37.90	37.90	36.10	37.90
	Gage (mm)	1.30	1.30	2.00	1.30	1.30
Outer layer	Diameter (mm)	40.40	40.40	40.40	39.10	40.40
	Gage (mm)	1.25	1.25	1.25	1.50	1.25
Cover	Diameter (mm)	42.70	42.70	42.70	42.70	42.70
	Gage (mm)	1.15	1.15	1.15	1.80	1.15
Ball	Diameter (mm)	42.70	42.70	42.70	42.70	42.70

(b) Weight of whole ball: Set to 45.0g.

The weight of golf ball is defined to be 45.93 g or less, or 1.62 oz (or 45.93 g) or less, by JGA or USGA. See, page 9, lines 7-12. For this calculation, it was assumed that the weight of the golf ball was 45.0g, to obtain objective specific gravity values under the severe condition for impartialness (*i.e.*, worst case scenario).

(c) Specific gravity of the intermediate layer 13: Calculated as 0.95.

According to the specification, Hytrel 5557, Himilan 1706 or Himilan 1706 and Himilan 1605 with a ratio of 50:50 are available to form the intermediate layer 13. See, page 10. The inventors selected the combination of Himilan 1706 and Himilan 1605 with a ratio of 50:50 among these to form Examples 1-5, which is evident from the given values of Shore D hardness in Table I, because the range of Shore D hardness 68 to 73 does not account for the use of either Hytrel 5557 having a Shore D hardness of 55 or Himilan 1706 having a Shore D hardness of 60 (See, attached data sheet). Therefore,

the range of the Shore D hardness in Table I is attributed to the combination of Himilan 1706 and Himilan 1605 with a ratio of 50:50 thereof.

According to the respective product data sheet, Himilan 1706 and Himilan 1605 has density of 950 and 940 kg/m³. Therefore, the density is considered up to 950 kg/m³ for the case. The value is converted to 0.95g/cm³ and is interpreted as specific gravity of 0.95 for the intermediate layer 13.

(d) Specific gravity of the outer layer 15: Calculated as 1.12 for Examples 1, 3 and 4, 1.15 for Example 2 and 1.16 for Example 5.

The specification discloses that Hytrel 4047, 4767, or 5612JB is used to form the outer layer 15. See, page 10. Hytrel 4047 was used for Examples 1, 3, and 4, and Hytrel 4767 was used for Example 2. This is evident by the values of Shore D hardness in Table I, which meet the values in the data sheet. (However, the product used to form Example 5 is unknown, since none of the material among the three Hytrel products has a Shore D hardness of 35 in Table I. The inventors believe that the hardness value of 35 is a typographical error and should be 45. Therefore, the highest specific gravity of 1.16 from Hytrel 5612JB among three Hytrel products is selected as specific gravity for Example 5 in the case.)

(e) Specific gravity of the cover: Calculated as 0.95

The specification says that the cover is formed of a combination of Himilan 1650 and Surlyn 8120. See, page 10. Since Himilan 1650 has a density of 950 kg/m³, which

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

represents a specific gravity of 0.95 and Surlyn 8120 has a specific gravity of 0.94, therefore, 0.95 is selected as the specific gravity for the layer in the case.

3. Calculation:

Volume (cm^3) and weight (g) of each layer are calculated by using the obtained parameters in Table II. Finally, specific gravity of the inner layer is further obtained by the calculation using these values.

It is noted that the total dimple volume assumptive of about 0.4 cm^3 is not subtracted from the whole volume of the golf ball so that the specific gravity calculation is conducted under the worst case scenario.

The specific gravity as calculated for each of the layer is shown in Table III below.

APPELLANT'S BRIEF ON APPEAL
 UNDER 37 C.F.R. § 1.192
 U.S. Appln. No.: 08/898,853

TABLE III

Layer		Example 1	Example 2	Example 3	Example 4	Example 5	Remarks
Inner layer	Diameter (mm)	35.30	35.30	33.90	33.50	35.30	G
	Volume (cm ³)	23.03	23.03	20.40	19.68	23.03	C
	Weight (g)	27.13	26.95	24.63	23.84	26.89	C
	Specific gravity	1.18	1.17	1.21	1.21	1.17	C
Intermediate Layer	Diameter (mm)	37.90	37.90	37.90	36.10	37.90	G
	Whole volume (cm ³)	28.50	28.50	28.50	24.63	28.50	C
	Layer volume (cm ³)	5.47	5.47	8.10	4.95	5.47	C
	Weight (g)	5.20	5.20	7.70	4.70	5.20	C
	Specific gravity	0.95	0.95	0.95	0.95	0.95	A
	Gage (mm)	1.30	1.30	2.00	1.30	1.30	C
Outer layer	Diameter (mm)	40.40	40.40	40.40	39.10	40.40	C
	Whole volume (cm ³)	34.53	34.53	34.53	31.30	34.53	C
	Layer volume (cm ³)	6.03	6.03	6.03	6.67	6.03	C
	Weight (g)	6.75	6.93	6.75	7.47	6.99	C
	Specific gravity	1.12	1.15	1.12	1.12	1.16	A
	Gage (mm)	1.25	1.25	1.25	1.50	1.25	G
Cover	Diameter (mm)	42.70	42.70	42.70	42.70	42.70	C
	Whole volume (cm ³)	40.76	40.76	40.76	40.76	40.76	C
	Layer volume (cm ³)	6.23	6.23	6.23	9.46	6.23	C
	Weight (g)	5.92	5.92	5.92	8.99	5.92	C
	Specific gravity	0.95	0.95	0.95	0.95	0.95	A
	Gage (mm)	1.15	1.15	1.15	1.80	1.15	G
Ball	Diameter (mm)	42.70	42.70	42.70	42.70	42.70	G
	Volume (cm ³)	40.76	40.76	40.76	40.76	40.76	C
	Weight (g)	45.0	45.0	45.0	45.0	45.0	A
	Specific gravity	1.10	1.10	1.10	1.10	1.10	C

Remarks:

A: Values given by certain calculations

C: Values given by calculations using the values by certain calculations and/or values given by Table I

G: Values given by Table I in the specification

(4) Results

As shown in Table III, the specific gravity of the inner layer is always larger than the specific gravity of the intermediate layer. The intermediate layer and outer layer have specific gravities which are lower than the specific gravity of the inner layer.

Accordingly, the foregoing calculations demonstrate that the subject matter of claim 16 is inherently, if not, expressly disclosed in the present application.

C. Claim 18

The Examiner states that there is no mention of the materials in claim 18. However, the present application clearly discloses subject matter to support this claim.

Claim 18 reads:

The solid golf ball according to claim 13, wherein at least one layer of said solid core is formed by using a material comprising one selected from ionomer resins and thermoplastic resins.

The present application expressly provides that the surrounding layer 13 may be made of an ionomer resin or thermoplastic resin. See, page 10:10-13; page 7:26-28. Also, the inner cover layer 15 may be made of a thermoplastic resin or ionomer resin. See, page 6:26-29 and 10:15-17.

IX. CONCLUSION

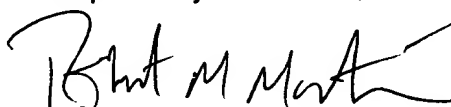
For all of the foregoing reasons, Appellant respectfully submits that the present application provides the support required for claims 13-19 of the present application. It is therefore requested that the rejection based on 35 U.S.C. §112, first paragraph, be reversed.

APPELLANT'S BRIEF ON APPEAL
UNDER 37 C.F.R. § 1.192
U.S. Appln. No.: 08/898,853

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert M. Masters", is written over a horizontal line.

Robert M. Masters
Registration No. 35,603

SUGHRUE MION, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, D.C. 20037-3213
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

Date: November 8, 2002

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.



Q45734
Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

DOCKETED

JUN 03 2002

Ex parte JUNJI HAYASHI, HISASHI YAMAGISHI and HIROSHI HIGUCHI

MAILED

Appeal No. 2001-1558
Application No. 09/086,493

MAY 31 2002

ON BRIEF

PAT. & TM. OFFICE
BOARD OF PATENT APPEAL
AND INTERFERENCES

Before ABRAMS, FRANKFORT, and NASE, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

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NOV 14 2002

TECHNOLOGY CENTER R3700

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 2 through 14, all of the claims remaining in this application. Claim 1 has been canceled.

Appellants' invention relates to a multi-piece solid golf ball having a four layer construction and, more particularly, to a golf ball comprising: a core (2) consisting of an inner sphere (3) and an enclosure layer (4) surrounding the inner sphere, and

Appeal No. 2001-1558
Application No. 09/086,493

a cover (5) surrounding the enclosure layer and consisting of inner and outer layers (6 and 7, respectively). In general, appellants have discovered that a golf ball having a soft inner sphere and a relatively hard enclosure layer and a cover surrounding the enclosure layer and consisting of a relatively soft outer layer and a harder inner layer provides a ball having improved spin performance upon approach shots with a sand wedge, etc. and presents a soft hitting feel upon approach shots and putting and at the same time, travels an increased distance and gives a pleasant soft hitting feel upon full shots with a driver independent of whether the head speed is high or low. Independent claim 22 is representative of the subject matter on appeal and a copy thereof may be found in the Appendix to appellants' ratified brief (Paper No. 21).

The sole prior art reference of record relied upon by the examiner in rejecting the appealed claims is:

Shimosaka et al. (Shimosaka) 5,816,937 Oct. 6, 1998

Claims 2 through 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimosaka.

Appeal No. 2001-1558
Application No. 09/086,493

Rather than reiterate the examiner's full statement of the above-noted rejection and the conflicting viewpoints advanced by the examiner and appellants regarding that rejection, we make reference to the final rejection (Paper No. 7, mailed February 14, 2000) and the examiner's answer (Paper No. 15, mailed December 19, 2000) for the reasoning in support of the rejection and to appellants' brief (Paper No. 14, filed October 5, 2000), reply brief (Paper No. 17, filed February 14, 2001) and ratified brief (filed August 17, 2001) for the arguments thereagainst.

OPINION

In reaching our decision in this appeal, this panel of the Board has given careful consideration to appellants' specification and claims, to the applied prior art Shimosaka reference, and to the respective positions articulated by appellants and the examiner. As a consequence of our review, we have reached the determination that the examiner's rejection of claims 2 through 14 under 35 U.S.C. § 103(a) will not be sustained. Our reasoning for that determination follows.

Appeal No. 2001-1558
Application No. 09/086,493

Shimosaka (like appellants) discloses a multi-piece solid golf ball comprising four layers or elements, i.e., a spherical core (1), an enclosure layer (3) surrounding the inner sphere, an intermediate layer (4) surrounding the enclosure layer and an outer layer (5) surrounding the intermediate layer and providing the outer surface layer of the ball. While it is true that Shimosaka describes the ball therein as comprising a core (1) and a cover of a multi-layer structure having at least three layers (3, 4, 5), we must agree with the examiner that, as a general proposition, the structure of a four layer or four element solid ball like that in Shimosaka is the same whether a layer, such as layer (3) for example, is denominated as a "core" layer or a "cover" layer. Thus, it does not appear that appellants' claiming of a core "consisting of an inner sphere and an enclosure layer surrounding the inner sphere" and a cover "consisting of an outer layer and an inner layer," would alone structurally distinguish from the four layer/element construction of Shimosaka.

However, in addition to the foregoing, appellants' claims on appeal include further limitations on the various layers or elements of the golf ball defined therein, such as, the relative

Appeal No. 2001-1558
Application No. 09/086,493

hardness of the various layers, the gage or thickness of the layers, and the distortion of the inner sphere relative to the ball as a whole under an applied load of 100 kg. In dealing with such added limitations, the examiner has not ascertained what the specific differences are between that which is found in Shimosaka and appellants' claimed subject matter and then provided us with an explanation as to why those differences would have been obvious to one of ordinary skill in the art at the time of appellants' invention, and has not provided any clear explanation as to why the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of appellants' invention. The examiner has instead taken the position that appellants are under a burden to show that the differences in the properties in question (e.g., hardness and gage) are "critical." The examiner has concluded that since Shimosaka shows that such properties as hardness and gage have a significant influence on the feel, spin and initial velocity of a golf ball, all the variables adjusted by appellants in the claims on appeal are recognized as result-effective variables and that accordingly "it would have been an obvious matter of design choice to one skilled in the art to have adjusted the variables

Appeal No. 2001-1558
Application No. 09/086,493

in Shimosaka in order to change the performance of the ball as desired" (final rejection, page 4).

While we see many similarities between the four element solid golf ball of Shimosaka and that claimed by appellants (i.e., a cover having an outer layer (5) with a hardness of < 55 Shore D that is within appellants' claimed range of 40 to 60 . . . Shore D, an inner cover layer (4) with a hardness of ≥ 55 Shore D within appellants' claimed range of 55 to 70 . . . Shore D, a core inner sphere (1) having a composition similar to that described in appellants' specification at pages 6-7 (note Shimosaka col. 4, line 51+), an enclosure layer (3) with a Shore D hardness of < 55 , and a distortion ratio within appellants' claimed range (see, col. 4, lines 46-50 and col. 5, lines 32-35 of Shimosaka)), we see the examiner's position as basically urging that it would have been obvious to try to manipulate the several variables involved to come up with appellants' claimed subject matter, an approach we view as inappropriate under 35 U.S.C. § 103. Further, we do not see how appellants can be expected to show that each and every one of the several variables in question is "critical," as the examiner seems to be urging as a requirement for patentability.

In addition, we must agree with appellants' position (brief, pages 7-8 and reply brief, page 4) that the examiner has erroneously concluded that appellants' claimed range of 1.5 to 3.0 mm set forth in independent claim 5 for the thickness or gage of the outer layer "clearly falls within" (answer, page 8) the range disclosed in Shimosaka. As is clearly shown in Figure 3 of Shimosaka, the thickness of the outer layer (5) of the ball therein is to be within the range of "0.02-1.1 mm." See also column 3, lines 39-40 of Shimosaka. Thus, the examiner's factual determination supporting this aspect of the § 103 rejection before us on appeal is incorrect.¹

In light of the foregoing, we agree with appellants' conclusion that the examiner has failed to establish a *prima*

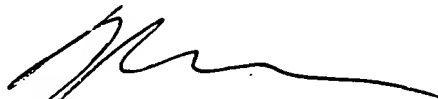
¹ Claim 13 depends from claim 5 and sets forth a gage or thickness for the outer layer of the ball as being in the range of "0.5 to 2.5 mm." This recited range is clearly outside of and inconsistent with the range of "1.5 to 3.0 mm" set forth in independent claim 5. Thus, claim 13 would appear to be indefinite. On page 9 of the specification, the range of thickness or gage of the ball outer layer is said to be "0.3 to 3.0 mm, especially 0.5 to 2.5 mm." Accordingly, it would appear that a range of "1.5 to 2.5 mm" would be consistent with the recitation in claim 5 and in appellants' specification, and was most likely intended by appellants in claim 13. In light of the disclosure on page 9 of appellants' specification concerning a preferred range of "especially 0.5 to 2.5 mm" and examples in Table 2 on page 14 having an outer ball layer thickness or gage of 1.5 mm, it would appear that the examiner's view that a range of "1.5 to 2.5 mm" was improper (see Paper No. 22) is in error.

Appeal No. 2001-1558
Application No. 09/086,493


facie case of obviousness with regard to the claimed subject matter before us on appeal. Accordingly, we will not sustain the examiner's rejection of claims 2 through 14 under 35 U.S.C. § 103(a).

The decision of the examiner is reversed.

REVERSED

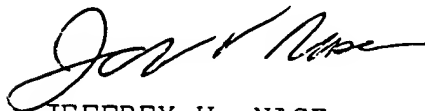


NEAL E. ABRAMS)
Administrative Patent Judge)



CHARLES E. FRANKFORT)
Administrative Patent Judge)

) BOARD OF PATENT
) APPEALS
) AND
) INTERFERENCES
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JEFFREY V. NASE)
Administrative Patent Judge)

CEF/LBG

Appeal No. 2001-1558
Application No. 09/086,493

SUGHRUE, MION, ZINN, MACPEAK and SEAS
2100 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20037-3202



B

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Hisashi YAMAGISHI, et al.

Application No.: 08/898,853

Group Art Unit: 3711

Confirmation No.: Unassigned

Examiner: Raeann Gorden

Filed: July 25, 1997

For: MULTI-PIECE SOLID GOLF BALL

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TECHNOLOGY CENTER R3700

FILED

DEC 21 2001

Declaration of Larry C. Cadorniga

I, Larry C. Cadorniga, hereby declare and aver as follows:

1. I reside at 4 Mill Creek Road, Piedmont, South Carolina. I am fully competent to testify regarding the subject matter of this Declaration and have personal knowledge of the facts set forth herein.

2. I took up Chemical Engineer studies at University of Sto. Tomas in Manila Phillippines. Other courses taken in the rubber field technology, management, and at the Philips Cross Quality College in Atlanta, Georgia USA.

3. I have extensive knowledge and experience in the field of golf, including areas involving the design, development, and manufacture of golf equipment such as golf balls and golf clubs. I have worked in this field for over 20 years. I also have received several U.S. patents relating to golf ball design. Attached hereto as Exhibit 1 is a copy of my curriculum vitae.

4. I have reviewed the above-referenced patent application Serial No. 09/898,853 to Yamagishi et al. (herein "the Yamagishi application"), including the disclosure, figures, and

correspondence between the Patent Office and applicant. I have further reviewed U.S. Patent No. 5,743,816 to Ohsumi et al. ("the Ohsumi patent").

5. I have been asked to consider whether an inner layer of a multi-piece solid golf ball is properly characterized as a part of the core or cover. Based on my years of experience in the field of golf ball design and development, I submit the following statements.

6. I am not aware of any standard definition used in the industry to determine what constitutes a core or a cover. As discussed below, there are general guidelines that may be used to determine whether an inner layer is a part of the cover or core, but such guidelines may not always be followed. While the innermost layer (or inner sphere) of a multi-piece golf ball would typically be characterized as a "core," and the outer most layer of a multi-piece solid golf ball would typically be characterized as a "cover," it is not so clear how to characterize a layer or layers positioned between the inner most layer (or inner sphere) and the outermost layer.

7. For example, it is clear that for a two-piece solid golf ball, the innermost piece (or sphere) would constitute the core and the outer layer enclosing the inner piece would constitute the cover. It is less clear whether the inner layer(s) of a three-piece or four-piece solid golf ball would be considered part of the core or cover. In some instances, the inner layer(s) of a three-piece or four-piece solid golf balls are simply called intermediate layers or inner layers.

8. However, in my opinion, there are general guidelines that are used to determine whether an inner layer of a three piece or four piece solid golf ball forms a portion of the core or cover. One guideline used to determine whether an inner layer is a portion of the core or cover is to consider the type of material that the inner layer is composed of. A second guideline is to consider the diameter of the innermost layer (or sphere) and other inner layers.

9. Generally, a core is made of a rubber-based material and it is typically a thermoset material. For example, polybutadiene is a common type of rubber-based material now used as a core material. These types of material provide sufficient initial velocity. If an inner layer is made of a thermoset, rubber based material, then it may be referred to as part of the core.

10. On the other hand, a cover is typically made of a thermoplastic material. For example, ionomer resin based materials (such as Surlyn or Hymilan) are generally used to form a cover. These materials are durable, enhance feel and yield a desired spin rate of a multi-piece solid golf ball, without substantially reducing the initial velocity. Thus, if an inner layer is made of a thermoplastic material, such as ionomer resin, that layer may be referred to as a part of the cover.

11. Generally, the diameter of a core including cores formed of one or more pieces is no greater than 1.58 inches (40.13 mm). Any layer of the ball formed outside of 1.58 inches will typically be referred to as a cover.

12. While these general guidelines may apply as to how one may characterize an inner layer of a three or four-piece solid golf ball, not everyone in the art follows the guidelines. In some cases, all layers but the outermost layer are referred to as a part of the core. In other cases, all layers but the innermost layer or sphere are referred to as a part of the cover. There is no standard definition that applies to state whether an inner layer is a part of the cover or core.

13. In reviewing the Yamagishi application, I note that layer 15 is referred to as an inner cover layer. The Yamagishi application refers to layer 15 as a part of the cover layer, and this nomenclature follows the general guidelines set forth above.

14. In reviewing the Ohsumi patent, it should be noted that all inner layers except for the outermost layer are referred to as the core. The outermost layer is referred to as the cover.

However, based on my experience, one of ordinary skill in the art would more likely refer to the layer 12c in Example 5 in Table 1 as part of the cover, not the core. I believe that Ohsumi patent refers to layer 12c in Example 5 incorrectly. In my opinion and following the general guidelines provided above, one of ordinary skill in the art of golf ball design would refer to layer 12c of Example 5 in Ohsumi patent as a cover and not as part of the core.

15. In addition, if I were to adopt the naming convention of the Ohsumi patent and apply that naming convention to the Yamagishi application, then the layer 15 of the ball disclosed in the Yamagishi application would be named a layer of the core, as opposed to the inner cover layer.

I, declare under the penalty of perjury that the foregoing is true and correct. Executed on December 20, 2001.

 10/20/01
Larry C. Cadorniga

LARRY C. CADORNIGA

4 Mill Creek Road
Piedmont, SC 29673

Tel/Fax: 864/422-0382
Email: cadorniga@aol.com

OBJECTIVE: Seeking a consulting position in Manufacturing, Research and Development, Quality Control, and Engineering where teamwork is key in accomplishing a common goal. Small projects welcome.

ACCOMPLISHMENTS AND WORK BACKGROUND:

DBA / LCC CONSULTING:

August 1999 to present R & D Consultant to Fantom Golf Limited, Korea/China
Develop/design golf ball products. Re-engineered Nike golf ball for improved overall performance.

July 1995 to present Gen. Manager/Consultant to Golf Tech Systems, Ltd., ROC
Total project responsibility in starting a new facility to manufacture golf balls. Planned and scheduled equipment design/purchase, general floor layout, product process flow, installations, debug, maintenance, operating procedure, etc., while providing all the product design technology involving chemical compositions and aerodynamic design for optimum performances.

Successfully developed and introduced the following golf ball products:

Exacta Tour Evolution	Exacta Extra Spin
Exacta 432 Professional	Exacta 432 Control
Exacta 432 Performance	Exacta Distance
Bald Eagle Tour/Spin	LCC Tour Hi Performance
LCC Tour Control	Top Ace
Triton Tour/Performance	Triton TLB
Intech / Titech Titanium	Arnold Palmer (Europe)

(all are USGA approved conforming golf balls)

April 1996 to July 1998 R & D Consultant to Bobby Grace Golf Designs by Cobra Golf, Calsbad, Ca.
Developed/designed elastomeric rubber compositions for golf putter face inserts to improve the general performances on feel and sound especially when a player is using a two piece construction golf ball.

Awarded one patent: (a second patent pending)

U S Patent no. 5,924,939 – “Golf Club Head with a Strike Face
Having a First Insert With In a Second Insert”

Successfully developed and introduced several models of Bobby Grace putters with inserts with overwhelming acceptance. The insert is known as “HSM”:

Bobby Grace AN7 HSM	Bobby Grace Little Man HSM
Bobby Grace the 2200 HSM	Bobby Grace Pip Squeek HSM
Bobby Grace KBI HSM	Bobby Grace by Cobra Payday HSM

Bobby Grace Low Pro HSM Bobby Grace by Cobra Soft Lady

March 1989 to July, 1995 **DUNLOP SLAZENGER CORP. - Maxfli Golf, GREENVILLE SC**
Positions Held: Director, Research and Development

Manager, Product Development

Managed the Research and Development department consisting of professionals and non-exempt associates, totaling 14 people, in supporting the company strategies. Participated as company Board Member to plan, control, and guide the company in ultimately achieving its goals.

Awarded Ten US Patents and Designs assigned to DSC:

Patent no. 5338083 Golf Ball Design	Patent no. D355943 Dimple Design
Patent no. 5321089 Golf Ball Cover	Patent no. 550795 Foamed Club
Patent no. 5415937 Golf Ball Cover	Patent no. 5580350 Core Cpd.
Patent no. 5470076 Dimple Pattern	Patent no. 5538794 Golf Ball Cover
Patent no. 5465969 Rubber Cpd.	Patent no. 5497996 Golf Balls

Successfully developed, introduced, manufactured following golf equipment:

Maxfli CD golf ball	Maxfli MD Golf balls
Maxfli MD(variable speed)	Maxfli HT Tour Balata golf ball
Maxfli HT Hi-Spin golf ball	Maxfli VHL Golf club set
Dunlop DDHIII golf ball	Dunlop DDH IV golf ball
Dunlop DDH Distance	Dunlop DDH Accuracy golf ball

Nov. 1986 to Mar. 1989 **Acushnet Company / Titleist Golf Div., Fairhaven, MA**
Position Held: Manager of Product Engineering

Managed the product engineering team consisting of professionals and non-exempt employees, totaling 8 people, in supporting company goals in new product development.

Awarded two US Patents assigned to Acushnet Co.

Patent no. 5020803 Golf Ball	Patent no. 4995613 Rubber Composition
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Successfully developed, introduced, manufactured following golf balls:

Titleist Tour Balata	Pinnacle Gold
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May 1980 to Nov. 1986 **MacGregor Golf Company, Albany Georgia**
Positions Held: Director, Golf Ball Operations

Manager, Golf Ball Operations

Senior Chemist, R & D

Managed golf ball operations, consisting of 60 personnel, producing about 500,000 dozen golf balls annually, while directing R&D efforts, as well.

Awarded two US Patents assigned to MacGregor

Patent no. 4836552 Short (Cayman) Golf Ball

Patent no. 4830116 Method of Making the Cayman Golf Ball

Successfully developed, introduced, manufactured following golf products:

MacGregor Tourney	MacGregor MT	Nicklaus D+D
Nicklaus DC	Muirfield Balata	Cayman Golf

Aug. 1976 **Wilson Sporting Goods, River Grove, Illinois**

to May 1980 *Positions Held: Manufacturing Manager*
Manufacturing Supervisor
Rubber Technologist - R&D

Instrumental in starting up a tennis and racquetball manufacturing plant, along with four other key personnel. The factory successfully produced excellent products accepted for US Open play and replaced all other tennis ball sourced by Wilson. Developed rubber core compositions for golf balls and rubber compounds for tennis and racquetballs.

Feb. 1968 **B. F. Goodrich Tire and Rubber Co., Manila, Philippines,**
to Aug. 1976 **Bearcat Tire Company and Salisbury Rubber Co., Chicago, Ill. Positions**

Held: Rubber Chemist
Developed rubber compositions and performed chemical tests and analysis.

*Layer 3 is the third innermost layer of AFP ball

USP No.	Assignee	Name of second innermost layer (layer 2)	material for layer 2	Name of second outermost layer (layer 3)	material for layer 3	Remarks
5,702,311	BSP	inner intermediate layer	rubbers, resins	outer intermediate layer	rubbers, resins	Both inner and outer intermediate layers are regarded as parts of core, see ll. 11 to 20 of col.4
5,688,595	BSP	surrounding layer	thermoplastic resins, rubbers	inner cover layer	preferably thermoplastic resins	Layer 2 is a part of core; please see last line of col. 2 to first line of col.3. Layer 3 is a part of cover; please see ll. Layer 2 is a part of core; please see second last paragraph of col. 2. Layer 3 is a part of cover.
5,725,442	BSP	surrounding layer	rubbers, resins	inner cover layer	ditto	Please see the second last paragraph of col. 2.
5,703,205	BSP	surrounding layer	ditto	inner cover layer	ditto	This invention shows at least three-layered cover.
5,818,537	BSP	innermost layer of cover	resins	intermediate layer of cover	resins	
5,273,286	D.J.C.Sun	intermediate core	carbonaceous materials	outer core	elastomer	three-piece core and cover
5,741,816	Kasco	intermediate layer of core	rubbers, resins	outer layer of core	rubbers, resins	three-layered core
5,830,086	BSP	surrounding layer	rubbers, resins	inner cover layer	preferably thermoplastic resins	two-layered core and two-layered cover
5,772,531	Kasco	intermediate layer of core	rubbers, resins	outer layer of core	rubbers, resins	three-layered core
5,783,293	Acushnet	inner layer of cover	polymers (rubber resins), ionomer resin	intermediate layer of cover	polymers (rubber resins), ionomer resin	three-layered cover
5,980,396	Sumitomo	inner layer of intermediate layer	resins, rubbers	outer layer of intermediate layer	resins, rubbers	intermediate layer has a two parts.